Frequently Asked Questions

1. **What is MassOrtho?**
    a. MassOrtho is a consortium of municipal GIS staff who, through regular meetings with the Eastern Mass. Municipal GIS Group, determined that regional orthoimagery procurement was worth pursuing. In other words, we are volunteers working for the greater good of GIS in the region.
    b. MassOrtho has defined the following goals:
        i. To lower the cost of orthoimagery acquisition for participating communities
        ii. To provide procurement and project management expertise at the regional level
        iii. To provide a basemap of regional orthoimagery that is accessible to various local, state, regional, and federal agencies
        iv. To provide a predictable and sustainable model for recurring imagery procurement

2. **Why is orthoimagery integral to a GIS program?**
Orthophotos looks like aerial photographs, but any distortions caused by the tilt of the camera or topography of the land have been removed. The imagery has also been "ortho-rectifed" to improve its geographic accuracy so that it matches other GIS mapping data. Orthoimagery is one of the foundational geographic data sets used in GIS mapping. Other GIS layers such as tax parcels, town boundaries, and road centerlines are geographically aligned to the features visible in the orthoimages. Using geographic analysis techniques, new GIS data can be derived from orthoimagery such as contour lines, impervious surface, land cover, and even view-sheds or solar energy potential. Planimetric GIS layers (visible features such as roads, building footprints, etc.) are typically derived from orthoimagery as well. Up-to-date municipal GIS data is critical for public safety, planning, tax assessing, and for asset management.

3. **When will the imagery be captured and who will manage the project?**

The imagery will be taken in the spring of 2014. USGS has agreed to do the procurement and quality assurance. MAPC and MassOrtho will do outreach and coordinate the communities that join the project. MAPC is providing MassOrtho with grant support during the project design phase. MassGIS will provide guidance and work closely with MassOrtho to coordinate the MassGIS spring 2014 flyover with MassOrtho's flyover.

4. **What will the specifications be?**
MassOrtho images will have 3 inch pixel resolution with 1 foot horizontal accuracy. The raw imagery will allow for 40- scale mapping and the creation of 2 foot contours. Please see the Fact Sheet for more detailed specifications: sites.google.com/site/massflyover/ However, the project does not include the development of any GIS vector data. This will be the responsibility of each participating municipality.

5. **MassGIS provides free imagery, why would my town/city participate in this project?**
    a. MassGIS will be collecting orthoimagery in the same time frame as the MassOrtho project. It will have 30 cm (approx. 1') resolution while MassOrtho images will have 3" resolution. That's four times higher. With high resolution comes greater accuracy and greater ability to identify features on the ground. See the difference here.
    b. MassGIS imagery will not be available to communities for the development of planimetric features, such as building footprints and manholes, or contours. MassOrtho participants will have access to the products necessary to develop planimetrics, topo, or other derivative products.

6. **Why don't we just use Google or Bing images?**
    Google and Bing images are copyrighted. They cannot be used to develop planimetrics or contours. The specs and even the capture dates are unknown. Often the images are taken when trees are leafed out so ground features are obscured. See this excellent article on the importance of *authoritative* imagery.

7. **What about Pictometry?**
    a. Pictometry's orthoimages have a horizontal accuracy suitable for 1" = 100' mapping while MassOrtho images will have a horizontal accuracy of 1" = 40' suitable for engineering design and municipal GIS.
    b. Pictometry generally offers municipalities the option of developing planimetric or contour data *only* if that option was selected as part of the original scope of services.

8. **Why join MassOrtho versus acquiring orthoimagery on our own?**
    a. Orthoimagery acquisition is technically complex. Most GIS managers do not understand all of the terminology and processes involved. Joining MassOrtho means that communities won't have to develop and manage the RFP process themselves.
    b. We anticipate significant cost savings due to the size of the project. Communities with recent, single-town flyovers had costs between $1,800 and $2,300 per square mile; MassOrtho's estimate from the United States Geological Survey (USGS) is $701 per square mile.
    c. High participation in the MassOrtho 2014 flyover makes it likely that this will be an ongoing program with flyovers approximately every five years.
    d. USGS brings extraordinary expertise to the project and has completed many similar projects other regional and state groups.

9. **What will it cost my community?**
    Municipalities should budget for approximately $701 per square mile, plus a 5% administrative fee that will cover the cost of US Geological Survey's (USGS) procurement and QA/QC of the imagery. This estimate was developed through the USGS's National Geospatial Technical

Operations Center (NGTOC) as part of the Geospatial Product and Service Contracts (GPSC). For more information about this entity, visit: geodatacontracts.er.usgs.gov/

10. How does my municipality or organization join MassOrtho?

Participants will need to sign a Memorandum of Understanding (MOU) with the Town of Arlington, who is the fiscal agent and liaison to USGS. The MOU will state the cost estimate for the participant and will commit the participant to payment prior to the deadline in December 1, 2013. It is recommended that payment be sent along with the signed MOU. The deadline to submit the signed MOU and payment is not flexible and will be clearly stated in the MOU. To become a participant, visit the MassOrtho website and complete the online registration: sites.google.com/site/massflyover/

11. Will the cost change with more participants?

There is a possibility that the cost will decrease with more participants. This depends on where in the state the additional participants are. A more contiguous region is beneficial to a cost decrease. We encourage you to discuss this project with your neighbors!

12. Will the cost change in any other way?

There is a likelihood that the USGS Inter-Governmental Cost Estimate will vary slightly from the contracted cost. The difference in cost will require a timely transaction between the Town of Arlington (fiscal agent) and the participant.

13. May I join the project after the deadline in December?

No, a firm deadline of December 1, 2013 will be set and no participants will be allowed after that time. MassOrtho is doing its best to set the deadline to allow for all Fall Town Meetings to have concluded and funding made available.

14. What happens if we commit, but then have to drop out?

A signed MOU binds you to this project. If the funding is not available or you think you may need to drop out, we recommend not signing the MOU.

15. **Have other states or regions done this?**

Yes, both Maine and Connecticut have state-wide, recurring orthoimagery projects. Both projects differ from MassOrtho, however, in that the state governments are major players in the consortiums. MassOrtho is coordinating with MassGIS and receives grant support from the Metropolitan Area Planning Council (MAPC), but it is not a joint project. We will continue to explore partnering with MassGIS in hopes of developing a recurring orthoimagery project in the future. [omit all this except the first sentence?]

16. What can we expect for return on investment?

An analysis of Maine's 2012 orthoimagery project estimates a 4x - 12x return on investment. Imagery use in three fields (forestry, stormwater, and transportation) was compared with

alternative financial investments. The study identified thirteen different sectors, public and private, that benefit from authoritative orthoimagery.

17. What will the deliverables be?

Deliverables will include all data to allow for planemetric vector data to be derived from the imagery.

FINAL PRODUCTS FOR DELIVERY	
Notes:	All deliveries will be in conventional soft copy formats via external hard drive or as mutually agreed upon at time of transfer.
Non-orthorectified, uncompressed imagery and project files:	Imagery will be suitable for development of 40-scale planemetrics by a vendor of the participant's choice.
Orthorectified, uncompressed imagery:	Data shall not be compressed during any phase of the production or delivery process.
	Tiles will be consistent with MassGIS 2013-2014 imagery
	Referenced to UTM projection and coordinate system (meters) using horizontal datum NAD83
Orthorectified, compressed imagery:	Mr SID with 80:1 compression ratio
	Mosaic should completely cover the participant's area, plus all quarter-tiles within or touching a 200 foot buffer from their defined boundary
	Referenced to Massachusetts State Plane projection and coordinate system (feet) using horizontal datum NAD83. Note: Massachusetts Mainland or Islands may be required

18. Will we be able to purchase planimetric and topographic data?

Planimetrics (roads, manholes, building footprints, signs, lakes and streams, etc.) and elevation contours are ***not*** part of the MassOrtho project. However, the raw imagery products needed to produce these vector GIS layers will be available as part of the MassOrtho project. Each municipality will need to contract for any further data development to meet their specific needs.

19. Can utilities, educational institutions, or regional agencies participate in the project?

MassOrtho will work with these types of entities to see if their area of interest fit within the scope of region. All aspects of applying and financial commitments would be the same as a municipality.

20. Can communities outside of greater-Boston participate?

Any Massachusetts community may join MassOrtho, due to the decision to use USGS as the procurement entity.

21. What is the timeline?

Task	Project Timeline	Notes
Participant to complete contact information survey and sign MOU with Arlington	Phase I: By July 31, 2013 Phase II: By August 31, 2013 Phase III: By November 15, 2013	• MassOrtho will provide an online survey and site to access MOU. • Statewide outreach will be conducted.
Payment from Participant to Arlington	By December 1, 2013	• Participants are allowed to submit payment as soon as MOU is signed. All payments are final and deadline is firm.
Arlington to sign Joint Funding Agreement with USGS	By December 15, 2013	• JFA will only be signed for amount that Arlington has in the MassOrtho fund as of this date.
Imagery collected	Between February – April 2014	
Payment from Arlington to USGS for services rendered as needed	March 2014 - December 2014	• Progress and payment milestones will be announced to all participants.
Final delivery of all products	By December 31, 2014	

22. What sort of quality control will there be?

USGS will provide quality assurance. They are highly experienced in evaluating imagery.

23. Will there be a later project if I can't join this one?

The success of the 2014 MassOrtho project will directly affect the likelihood of future flyovers. The consortium hopes to establish a 5-year orthoimagery cycle. If another flyover occurs in 2019, additional municipalities could join and 2014 participants could decline to participate.

24. Who will own the imagery and how will it be distributed?

The final images will be in the public domain. The consortium is looking for an education or government partner to host the imagery thereby making the imagery available as a free download. Stereo-pairs and control files necessary for further image processing (e.g. for planimetric and contour development) will be made available to individual communities as part of the project. Participating communities will control their own raw data.

25. How do I get more information?

See the MassOrtho website (https://sites.google.com/site/massflyover/) for up-to-date information on the project. This primer provides a good overview of photogrammetry, and the Maine Geolibrary contains useful background information on authoritative imagery. You may also email anyone on the MassOrtho Sub-Committee: Adam Kurowski

(akurowski@town.arlington.ma.us), Laura DeGroot (ldegroot@andoverma.gov), or Kim Honetschlager (khonetschlager@ci.reading.ma.us).